Space Weather Forecast

Issued on Friday, 15 April 2022 at 13:07 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor geomagnetic storms possible at first on day 1 (15th) due to CME affects, and more likely later on day 2 (16th).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate with a long duration Moderate flare observed and this commenced at 15/1050 UTC. There are signs of increasing activity as potential regions from the far side approach and this appears to be the source. There are three sunspots on the disc, and these are all currently small with little activity observed. No Earth-directed coronal mass ejections (CMEs) have been observed.

Solar Wind / Geomagnetic Activity: The solar wind was slightly elevated to elevated after the Coronal Mass Ejection (CME) arrived around 14/1230 UTC. The CME left the Sun on 11th April. The magnetic field carried by the wind was Moderate to Strong with long periods observed when the important north-south component was in the negative (southward) direction. This resulted in Minor Storm intervals observed 14/1800-2100 UTC and 15/0000-0300 UTC. Between 14/1500-1800 UTC a Moderate geomagnetic storm intervals was observed.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Moderate. The three sunspot regions on the disc are small, and only showing limited growth, however activity from the far-side is increasingly likely to affect the Earth as it rotates near to and onto the near-side through the period. Further Moderate flares are likely as the more active regions on the far side approach the eastern limb.

Solar Wind / Geomagnetic Activity: Earth is currently experiencing the CME magnetic cloud which left the Sun on the 11th, with ongoing affects forecast during day 1 (15th). Solar winds are forecast to ease before a further enhancement from the arrival of the fast wind is forecast later on day 2 (16th), although this carries low confidence. No further CME arrivals are anticipated. Geomagnetic activity is forecast to be mostly Quiet to Unsettled, becoming Active to Minor Storm at first and again on arrival of the faster solar winds, most likely later day 2 (16th) or day 3 (17th). By day 4 (17th-18th) a return to mainly Quiet conditions is likely.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	80	30	20	5
Strong	G3	No	2	2	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	30	40	50
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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